

In the Claims:

Claims 1-6,, 9-12, 15-17 and 19-21 are pending in the application.

Claims 2, 4-6, 16, 17 and 21 are allowed.

Claims.1, 3, 9-12, 15, 19 and 20 stand rejected.

Explanation of Amendments in the Claims:

1.(currently amended) A centrifuge bowl for use in an apparatus for separating intermixed particulate materials of different specific gravity in a slurry where the apparatus includes a feed duct for feeding the slurry into the bowl so that during rotation of the bowl the intermixed particulate materials flow over a peripheral wall of the bowl for collection of heavier particulate materials on the peripheral wall and for discharge of the lighter particulate materials in the slurry from the open mouth and a launder for collecting the lighter particulate materials in the slurry discharged from the open mouth, the bowl comprising

a base and a peripheral wall surrounding an axis passing through the base and generally upstanding from the base to an open mouth;

and a plurality of annular recesses on the peripheral wall at axially spaced positions over which the materials pass, when fed from the supply duct, so that the heavier particulate materials collect in the recesses;

each recess being defined by two recess side walls extending generally outwardly from the axis from an open mouth of the recess toward a base of the recess at the peripheral wall and converging toward one another;

a fluidizing liquid injection system for fluidizing the materials in each of the recesses including a liquid supply and at least one liquid entry opening extending from the supply into the recess at or closely adjacent the base of the recess;

and a plurality of removable insert members each mounted in a respective one of the recesses;

each insert member being mounted in its respective recess at a position therein so as to define a channel between the side walls, inwardly of the base of the recess and outwardly of the insert member within which the fluidizing liquid from the liquid entry opening can flow within the recess;

each insert member having an inwardly facing surface which spans the space between the side walls at the insert member so as to confine the materials within the volume of the recess defined by the side walls and inwardly of the inwardly facing surface of the insert member;

each insert member being formed of a material which is not a screen material mesh so that the material is imperforate;

which imperforate material has an array of fluid injection holes formed through the imperforate material shaped and arranged to cause the injection of jets of fluidizing liquid from the channel through the holes in the insert member into the volume.

2.(previously amended) A centrifuge bowl for use in an apparatus for separating intermixed particulate materials of different specific gravity in a slurry where the apparatus includes a feed duct for feeding the slurry into the bowl so that during rotation of the bowl the intermixed particulate materials flow over a peripheral wall of the bowl for collection of heavier particulate materials on the peripheral wall and for discharge of the lighter particulate materials in the slurry from the open mouth and a launder for collecting the lighter particulate materials in the slurry discharged from the open mouth, the bowl comprising

a base and a peripheral wall surrounding an axis passing through the base and generally upstanding from the base to an open mouth;

and a plurality of annular recesses on the peripheral wall at axially spaced positions over which the materials pass, when fed from the supply duct, so that the heavier particulate materials collect in the recesses;

each recess being defined by two recess side walls extending generally outwardly from the axis from an open mouth of the recess toward a base of the recess at the peripheral wall and converging toward one another;

a fluidizing liquid injection system for fluidizing the materials in each of the recesses including a liquid supply and at least one liquid entry opening extending from the supply into the recess at or closely adjacent the base of the recess;

and a plurality of removable insert members each mounted in a respective one of the recesses;

each insert member being mounted in its respective recess at a position therein so as to define a channel between the side walls, inwardly of the base of the recess and outwardly of the insert member within which the fluidizing liquid from the liquid entry opening can flow within the recess;

each insert member having an inwardly facing surface which spans the space between the side walls at the insert member so as to confine the materials within the volume of the recess defined by the side walls and inwardly of the inwardly facing surface of the insert member;

each insert member having an array of fluid injection holes defined therethrough shaped and arranged to cause the injection of jets of fluidizing liquid from the channel through the insert member into the volume;

wherein each insert member is sufficiently thick so that at least some of the injection holes have a specified direction along an axis of the hole tending to direct the jet of fluidizing liquid in a direction along the axis of the hole;

and wherein said at least some of the holes are formed such that the axis thereof lies on a direction which is different from a line radial to the axis of the bowl.

3.(previously amended) The bowl according to Claim 1 wherein the injection holes are smaller in transverse dimensions than the fluid entry openings.

4.(previously amended) A centrifuge bowl for use in an apparatus for separating intermixed particulate materials of different specific gravity in a slurry where the apparatus includes a feed duct for feeding the slurry into the bowl so that during rotation of the bowl the intermixed particulate materials flow over a peripheral wall of the bowl for collection of heavier particulate materials on the peripheral wall and for discharge of the lighter particulate materials in the slurry from the open mouth and a launder for collecting the lighter particulate materials in the slurry discharged from the open mouth, the bowl comprising

a base and a peripheral wall surrounding an axis passing through the base and generally upstanding from the base to an open mouth;

and a plurality of annular recesses on the peripheral wall at axially spaced positions over which the materials pass, when fed from the supply duct, so that the heavier particulate materials collect in the recesses;

each recess being defined by two recess side walls extending generally outwardly from the axis from an open mouth of the recess toward a base of the recess at the peripheral wall and converging toward one another;

a fluidizing liquid injection system for fluidizing the materials in each of the recesses including a liquid supply and at least one liquid entry opening extending from the supply into the recess at or closely adjacent the base of the recess;

and a plurality of removable insert members each mounted in a respective one of the recesses;

each insert member being mounted in its respective recess at a position therein so as to define a channel between the side walls, inwardly of the base of the recess and outwardly of the insert member within which the fluidizing liquid from the liquid entry opening can flow within the recess;

each insert member having an inwardly facing surface which spans the space between the side walls at the insert member so as to confine the materials within the volume of the recess defined by the side walls and inwardly of the inwardly facing surface of the insert member;

each insert member having an array of fluid injection holes defined therethrough shaped and arranged to cause the injection of jets of fluidizing liquid from the channel through the insert member into the volume;

wherein the total area of the fluid entry openings is greater than the total area of the injection holes.

5.(previously amended) A centrifuge bowl for use in an apparatus for separating intermixed particulate materials of different specific gravity in a slurry where the apparatus includes a feed duct for feeding the slurry into the bowl so that during rotation of the bowl the intermixed particulate materials flow over a peripheral wall of the bowl for collection of heavier particulate materials on the peripheral wall and for

discharge of the lighter particulate materials in the slurry from the open mouth and a launder for collecting the lighter particulate materials in the slurry discharged from the open mouth, the bowl comprising

a base and a peripheral wall surrounding an axis passing through the base and generally upstanding from the base to an open mouth;

and a plurality of annular recesses on the peripheral wall at axially spaced positions over which the materials pass, when fed from the supply duct, so that the heavier particulate materials collect in the recesses;

each recess being defined by two recess side walls extending generally outwardly from the axis from an open mouth of the recess toward a base of the recess at the peripheral wall and converging toward one another;

a fluidizing liquid injection system for fluidizing the materials in each of the recesses including a liquid supply and at least one liquid entry opening extending from the supply into the recess at or closely adjacent the base of the recess;

and a plurality of removable insert members each mounted in a respective one of the recesses;

each insert member being mounted in its respective recess at a position therein so as to define a channel between the side walls, inwardly of the base of the recess and outwardly of the insert member within which the fluidizing liquid from the liquid entry opening can flow within the recess;

each insert member having an inwardly facing surface which spans the space between the side walls at the insert member so as to confine the materials within

the volume of the recess defined by the side walls and inwardly of the inwardly facing surface of the insert member;

each insert member having an array of fluid injection holes defined therethrough shaped and arranged to cause the injection of jets of fluidizing liquid from the channel through the insert member into the volume;

wherein the side walls of each recess each include a shoulder spaced from the base of the recess and formed in the side wall and facing generally radially inwardly of the bowl toward the axis of the bowl onto into which an outwardly facing surface of the insert member engages to support the insert member against movement radially outwardly of the bowl.

6.(previously amended) The bowl according to Claim 5 wherein each insert member has the side edges including one or more barbs arranged to engage into the side wall of the recess at the shoulder therein.

7.(cancelled).

8.(cancelled).

9.(original) The bowl according to Claim 1 wherein each insert member has a projecting portion extending therefrom inwardly toward the axis.

10.(original) The bowl according to Claim 9 wherein each insert member includes at least two rows of holes at axially spaced positions across the width of the insert member and wherein the projecting portion is arranged between the rows.

11.(previously amended) The bowl according to Claim 1 wherein there is provided at least one imperforate insert member; the at least one imperforate insert member being mounted in a respective recess at a position therein so as to define a

channel between the side walls, inwardly of the base of the recess and outwardly of the insert member within which the fluidizing liquid from the liquid entry opening can flow within the recess; the at least one imperforate insert member having an inwardly facing surface which spans the space between the side walls at the imperforate insert member so as to confine the materials within the volume of the recess defined by the side walls and inwardly of the inwardly facing surface of the imperforate insert member; the at least one imperforate insert member being arranged so as to prevent flow of liquid from the channel to the volume.

12.(previously amended) The bowl according to Claim 11 wherein the insert members of alternate ones of the recesses are imperforate.

13.(cancelled).

14.(cancelled) .

15.(currently amended) A replacement insert member:

for use in a centrifuge bowl for use in an apparatus for separating intermixed particulate materials of different specific gravity in a slurry where the apparatus includes:

a feed duct for feeding the slurry into the bowl so that during rotation of the bowl the intermixed particulate materials flow over a peripheral wall of the bowl for collection of heavier particulate materials on the peripheral wall and for discharge of the lighter particulate materials in the slurry from the open mouth;

a launder for collecting the lighter particulate materials in the slurry discharged from the open mouth;

a bowl;

the bowl having a base and a peripheral wall surrounding an axis passing through the base and generally upstanding from the base to an open mouth;

the bowl having a plurality of annular recesses on the peripheral wall at axially spaced positions over which the materials pass, when fed from the supply duct, so that the heavier particulate materials collect in the recesses;

each recess being defined by two recess side walls extending generally outwardly from the axis from an open mouth of the recess toward a base of the recess at the peripheral wall and converging toward one another;

the bowl having a fluidizing liquid injection system for fluidizing the materials in each of the recesses including a liquid supply and at least one liquid entry opening extending from the supply into the recess at or closely adjacent the base of the recess;

the replacement insert member comprising an elongate insert body arranged to be mounted in a respective one of the recesses so as to define a channel between the side walls, inwardly of the base and outwardly of the insert member within which the fluidizing liquid from the liquid entry opening can flow around the recess;

the elongate insert body having an inwardly facing surface which is arranged to span the space between the side walls at the insert member so as to confine the materials within the volume of the recess defined by the side walls and inwardly of the inwardly facing surface of the insert member;

each insert member being formed of a material which is not a ~~screen~~ material mesh so that the material is imperforate;

which imperforate material has an array of fluid injection holes formed through the imperforate material shaped and arranged to cause the injection of jets of fluidizing liquid from the channel through the holes in the insert member into the volume.

16.(previously amended) A replacement insert member:

for use in a centrifuge bowl for use in an apparatus for separating intermixed particulate materials of different specific gravity in a slurry where the apparatus includes:

a feed duct for feeding the slurry into the bowl so that during rotation of the bowl the intermixed particulate materials flow over a peripheral wall of the bowl for collection of heavier particulate materials on the peripheral wall and for discharge of the lighter particulate materials in the slurry from the open mouth;

a launder for collecting the lighter particulate materials in the slurry discharged from the open mouth;

a bowl;

the bowl having a base and a peripheral wall surrounding an axis passing through the base and generally upstanding from the base to an open mouth;

the bowl having a plurality of annular recesses on the peripheral wall at axially spaced positions over which the materials pass, when fed from the supply duct, so that the heavier particulate materials collect in the recesses;

each recess being defined by two recess side walls extending generally outwardly from the axis from an open mouth of the recess toward a base of the recess at the peripheral wall and converging toward one another;

the bowl having a fluidizing liquid injection system for fluidizing the materials in each of the recesses including a liquid supply and at least one liquid entry opening extending from the supply into the recess at or closely adjacent the base of the recess;

the replacement insert member comprising an elongate insert body arranged to be mounted in a respective one of the recesses so as to define a channel between the side walls, inwardly of the base and outwardly of the insert member within which the fluidizing liquid from the liquid entry opening can flow around the recess;

the elongate insert body having an inwardly facing surface which is arranged to span the space between the side walls at the insert member so as to confine the materials within the volume of the recess defined by the side walls and inwardly of the inwardly facing surface of the insert member;

the insert body having an array of fluid injection holes shaped and arranged to cause the injection of jets of fluidizing liquid from the channel through the holes in the insert member into the volume;

wherein the insert body is sufficiently thick so that at least some of the injection holes have a specified direction along an axis of the hole tending to direct the jet of fluidizing liquid in a direction along the axis of the hole;

and wherein said at least some of the holes are formed such that the axis thereof, when the insert body is located in the bowl, lies on a direction which is different from a line radial to the axis of the bowl.

17.(previously amended) A replacement insert member:

for use in a centrifuge bowl for use in an apparatus for separating intermixed particulate materials of different specific gravity in a slurry where the apparatus includes:

a feed duct for feeding the slurry into the bowl so that during rotation of the bowl the intermixed particulate materials flow over a peripheral wall of the bowl for collection of heavier particulate materials on the peripheral wall and for discharge of the lighter particulate materials in the slurry from the open mouth;

a launder for collecting the lighter particulate materials in the slurry discharged from the open mouth;

a bowl;

the bowl having a base and a peripheral wall surrounding an axis passing through the base and generally upstanding from the base to an open mouth;

the bowl having a plurality of annular recesses on the peripheral wall at axially spaced positions over which the materials pass, when fed from the supply duct, so that the heavier particulate materials collect in the recesses;

each recess being defined by two recess side walls extending generally outwardly from the axis from an open mouth of the recess toward a base of the recess at the peripheral wall and converging toward one another;

the bowl having a fluidizing liquid injection system for fluidizing the materials in each of the recesses including a liquid supply and at least one liquid entry opening extending from the supply into the recess at or closely adjacent the base of the recess;

15

the replacement insert member comprising an elongate insert body arranged to be mounted in a respective one of the recesses so as to define a channel between the side walls, inwardly of the base and outwardly of the insert member within which the fluidizing liquid from the liquid entry opening can flow around the recess;

the elongate insert body having an inwardly facing surface which is arranged to span the space between the side walls at the insert member so as to confine the materials within the volume of the recess defined by the side walls and inwardly of the inwardly facing surface of the insert member;

the insert body having an array of fluid injection holes shaped and arranged to cause the injection of jets of fluidizing liquid from the channel through the holes in the insert member into the volume;

wherein the insert body has side edges thereof each including one or more barbs arranged to engage into the side wall of the recess.

18.(cancelled).

19.(previously amended) The insert member according to Claim 15 wherein the insert body has a projecting portion arranged to extend therefrom inwardly toward the axis.

20.(original) The insert member according to Claim 19 wherein the insert body includes at least two rows of holes at axially spaced positions across the width of the insert member and wherein the projecting portion is arranged between the rows.

21.(previously presented) A centrifuge bowl for use in an apparatus for separating intermixed particulate materials of different specific gravity in a slurry where the apparatus includes a feed duct for feeding the slurry into the bowl so that during

rotation of the bowl the intermixed particulate materials flow over a peripheral wall of the bowl for collection of heavier particulate materials on the peripheral wall and for discharge of the lighter particulate materials in the slurry from the open mouth and a launder for collecting the lighter particulate materials in the slurry discharged from the open mouth, the bowl comprising

a base and a peripheral wall surrounding an axis passing through the base and generally upstanding from the base to an open mouth;

and a plurality of annular recesses on the peripheral wall at axially spaced positions over which the materials pass, when fed from the supply duct, so that the heavier particulate materials collect in the recesses;

each recess being defined by two recess side walls extending generally outwardly from the axis from an open mouth of the recess toward a base of the recess at the peripheral wall and converging toward one another;

a fluidizing liquid injection system for fluidizing the materials in each of the recesses including a liquid supply and at least one liquid entry opening extending from the supply into the recess at or closely adjacent the base of the recess;

and a plurality of removable insert members each mounted in a respective one of the recesses;

each insert member being mounted in its respective recess at a position therein so as to define a channel between the side walls, inwardly of the base of the recess and outwardly of the insert member within which the fluidizing liquid from the liquid entry opening can flow within the recess;

each insert member having an inwardly facing surface which spans the space between the side walls at the insert member so as to confine the materials within the volume of the recess defined by the side walls and inwardly of the inwardly facing surface of the insert member;

each insert member having an array of fluid injection holes defined therethrough which allow the injection of jets of fluidizing liquid from the channel through the insert member into the volume;

wherein each insert member has the side edges including one or more barbs arranged to engage into the side wall of the recess.